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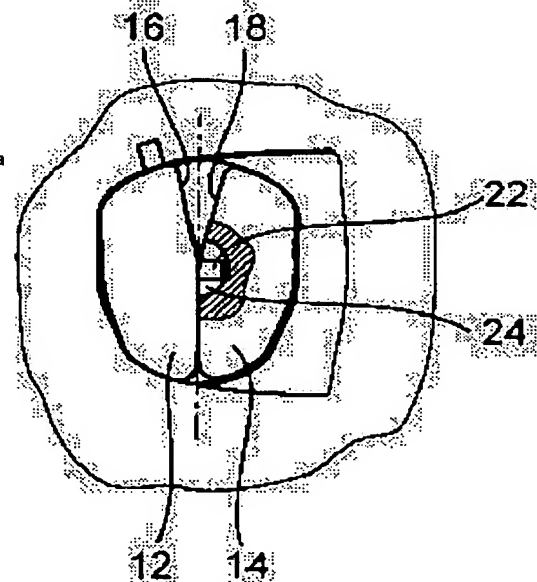
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(54) LINK PLATE CHAIN

(57)Abstract:

PROBLEM TO BE SOLVED: To prevent deteriorating functionality of chain by relatively shifting a cradle pin to a link plate in a side direction even when bending angles are significantly large.

SOLUTION: Projection part 22 is provided on one side of each rolling surfaces 16, 18 positioned to face each other is provided. The projection part 22 is engaged with a cut-off part 24 formed on another side of the rolling surface 18 to prevent mutual shift of cradle pins 12, 14 arranged as a pair in a side direction.



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CLAIMS

[Claim(s)]

[Claim 1] It is a link plate chain for the cone disk type volume credit gear which can be adjusted at a stepless ceremony. The link plate with which the link plate of the link plate chain concerned was mutually shifted, and has been arranged by the longitudinal direction of a chain. It is mutually combined with the joint type through the cradle pin which was pushed in in the notch which overlaps mutually and which has been arranged by the pair, respectively. The field located in an opposite side mutually [of both the cradle pin] is engaging with the configuration connection target at the common-law marriage section of a notch. Both the cradle pin faces mutually and the field in which it is located forms the rolling surface. Both rolling surfaces come to roll each other at the time of the deflection of the link plate chain concerned. The end face which projects in the side is prepared from the link plate of the cradle pin for contacting the conical surface of a cone disk. In a cradle pin or the thing of the format that the link plate besides ** is equipped with the attachment section, respectively, and this attachment section has prevented the drop to the side of the cradle pin from the link plate chain concerned. The lobe is prepared in one side. each of both rolling surfaces which faces mutually and is located — The link plate chain which this lobe is being engaged in the notch formed in the rolling surface of another side, respectively, and is characterized by having prevented the mutual gap in the side of the cradle pin arranged by the pair.

[Claim 2] It is a link plate chain for the cone disk type volume credit gear which can be adjusted at a stepless ceremony. The link plate with which the link plate of the link plate chain concerned was mutually shifted, and has been arranged by the longitudinal direction of a chain. It is mutually combined with the joint type through the cradle pin which was pushed in in the notch which overlaps mutually and which has been arranged by the pair, respectively. The field located in an opposite side mutually [of both the cradle pin] is engaging with the configuration connection target at the common-law marriage section of a notch. Both the cradle pin faces mutually and the field in which it is located forms the rolling surface. Both rolling surfaces come to roll each other at the time of the deflection of the link plate chain concerned. The end face which projects in the side is prepared from the link plate of the cradle pin for contacting the conical surface of a cone disk. In the thing of the format that the drop to the side of the cradle pin from the link plate chain concerned is prevented. The link plate chain characterized by preparing the additional location fixed component for preventing the drop to the side of the cradle pin from the link plate chain concerned.

[Claim 3] The link plate chain according to claim 2 with which a location fixed component covers the link plate chain concerned in the side and which it is formed as a location holddown member of U typeface on the whole, and the leg of this location holddown member has the notch, and one end face of a cradle pin pair projected, respectively, and the notch engaged with the cradle pin, and has prevented the gap in the side of this cradle pin from this notch.

[Claim 4] The link plate chain according to claim 3 with which the location holddown member is formed as a sheet metal part.

[Claim 5] The link plate chain according to claim 3 or 4 with which the notch of the leg has the lobe and this lobe engages with the notch of a cradle pin.

[Claim 6] The link plate chain according to claim 2 with which the location fixed component formed as a spring element which both the cradle pin of a cradle pin pair faces mutually, and the slot which extends in the longitudinal direction of the link plate chain concerned is formed in the edge field which projects from the link plate besides ** in the side of the field in which it is located, and is prolonged exceeding the notch of a link plate in a longitudinal direction in this slot, and covers the side face of a link plate is inserted.

[Claim 7] ***** which is held by Mizouchi who a spring element is equipped with two arms to which preloading was able to be applied in the direction elastically left mutually through a circular bracket, and is formed in it, and both arms were incurvated, and was formed, and is prolonged exceeding a notch in a longitudinal direction, a link plate chain according to claim 6.

[Claim 8] The link plate chain according to claim 6 with which the spring element is formed as a hook bent at the edge.

[Claim 9] The link plate chain according to claim 2 with which it is being fixed to the outside surface of the link plate besides **, and a location fixed component has closed the notch of a link plate between both the cradle pin pairs that project from this notch, the location fixed attachment section prepared in the cradle pin which adjoins a location fixed component overlaps a location fixed component, and the location fixed attachment section attached in an outside cradle pin, respectively overlaps the edge of a notch.

[Claim 10] The link plate chain according to claim 9 whose location fixed component is a sheet metal blanking part.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention is a link plate chain for the cone disk type volume credit gear which can be adjusted at a stepless ceremony. The link plate with which the link plate of the link plate chain concerned was mutually shifted, and has been arranged by the longitudinal direction of a chain. It is mutually combined with the joint type through the cradle pin which was pushed in in the notch which overlaps mutually and which has been arranged by the pair, respectively. The field located in an opposite side mutually [of both the cradle pin] is engaging with the configuration connection target at the common-law marriage section of a notch. Both the cradle pin faces mutually and the field in which it is located forms the rolling surface. Both rolling surfaces come to roll each other at the time of the deflection of the link plate chain concerned. The end face which projects in the side is prepared from the link plate of the cradle pin for contacting the conical surface of a cone disk. It is related with a cradle pin or the thing of the format that the link plate besides ** is equipped with the attachment section, respectively, and this attachment section has prevented the drop to the side of the cradle pin from the link plate chain concerned.

[0002] Furthermore, this invention is a link plate chain for the cone disk type volume credit gear which can be adjusted at a stepless ceremony. The link plate with which the link plate of the link plate chain concerned was mutually shifted, and has been arranged by the longitudinal direction of a chain. It is mutually combined with the joint type through the cradle pin which was pushed in in the notch which overlaps mutually and which has been arranged by the pair, respectively. The field located in an opposite side mutually [of both the cradle pin] is engaging with the configuration connection target at the common-law marriage section of a notch. Both the cradle pin faces mutually and the field in which it is located forms the rolling surface. Both rolling surfaces come to roll each other at the time of the deflection of the link plate chain concerned. The end face which projects in a link plate to the side of the cradle pin for contacting the conical surface of a cone disk is prepared, and it is related with the thing of the format that the drop to the side of the cradle pin from the link plate chain concerned is prevented.

[0003]

[Description of the Prior Art] The link plate chain of the format stated at the beginning is well-known based on for example, the Federal Republic of Germany patent application disclosure No. 3027834 description. A link plate can move to the side relatively to a splash press piece or a cradle pin, or the problem you are made to produce actually with such a link plate chain is in the point that even a cradle pin may fall from a chain in the side, when the angle of bend of a chain exceeds the scale specified beforehand. By this, since the attachment section prepared in the cradle pin for location immobilization of a cradle pin does not engage with the notch of the link plate of affiliation from behind any longer, the gap of it in the relative side will become possible to the link plate of the cradle pin which infringes on the functionality of a link plate chain.

[0004]

[Problem(s) to be Solved by the Invention] The technical problem of this invention is making it there be no risk of saying that the link plate chain of the format stated at the beginning is improved, a cradle pin shifts to the side relatively to a link plate even when an angle of bend is remarkable and large, and this infringes on the functionality of a chain.

[0005]

[Means for Solving the Problem] each of both rolling surfaces which faces mutually and is located with the configuration of this invention in order to solve this technical problem — the lobe was prepared in one side, and this lobe is being engaged in the notch formed in the rolling surface of another side, respectively, and had prevented the mutual gap in the side of the cradle pin arranged by the pair.

[0006] Furthermore, in order to solve this technical problem, with the configuration of this invention, the additional location fixed component for preventing the drop to the side of the cradle pin from the link plate chain concerned was prepared.

[0007] By subordination claims 3-10, the advantageous configuration and advantageous modification of a link plate chain according to claim 2 have characterized.

[0008]

[Embodiment of the Invention] Below, the gestalt of operation of this invention is explained in detail per drawing.

[0009] drawing 1 — structure — being related — the very thing — the side elevation has shown three link plates 2, 4, and 6 of a well-known link plate chain. The link plate 2 is a link plate besides **, and the link plates 4 and 6 are link plates which adjoin the link plate 2 besides ** in the side, respectively. Both the links plates 4 and 6 are relatively shifted and arranged to the link plate 2 besides ** at the longitudinal direction. Each link plate has one hole or one notch 8. this notch 8 — respectively — two cradle pin pairs — it has penetrated by 10. Both the links plates 2 and 4 of each other are combined by the longitudinal direction of a link plate chain through the left-hand side cradle pin pair, and both the links plates 2 and 6 of each other are combined by the longitudinal direction of a link plate chain through the right-hand side cradle pin pair so that clearly from drawing 1 . in this case — the time of the effective tension at the longitudinal direction of a link plate chain — a left-hand side cradle pin pair — the cradle pin 12 on the left-hand side of 10 is supported in the common-law marriage section on the left-hand side of the notch 8 of the link plate 2 — having — **** — a right-hand side cradle pin pair — the cradle pin 14 on the right-hand side of 10 is supported by the common-law marriage section on the right-hand side of the notch 8 of the link plate 2. a left-hand side cradle pin pair — the cradle pin 14 on the right-hand side of 10 is supported by the common-law marriage section on the right-hand side of the notch 8 of the link plate 4 — receiving — a right-hand side cradle pin pair — the cradle pin 12 on the left-hand side of 10 is supported by the common-law marriage section on the left-hand side of the notch 8 of the link plate 6. the outside surface of the cradle pins 12 and 14 — the inner surface of each notch — a configuration — being connective (formschliessig)

— or it is formed, respectively so that it may engage with rotation impossible and may be located. the link plate 2 and 4; — if 2 and 6 rotate mutually at the time of the deflection of a link plate chain, the rolling surfaces 16 and 18 formed in the field in which it faces mutually and is located so that both the cradle pins 12 and 14 may be contacted will roll each other.

[0010] The one location fixed attachment section 20 is formed in the cradle pin 12 which engages with the link plate 2 of **** at rotation impossible, i.e., the cradle pin on the left-hand side of drawing 1 , and the right-hand side cradle pin 14, respectively.

This location fixed attachment section 20 has covered the edge of a notch 8, or the side face of the link plate 2, and has prevented the gap in the relative side to the link plate 2 of each cradle pin.

[0011] a left-hand side cradle pin pair — the cradle pin pair of the cradle pin 14 of 10, or right-hand side — in the suitable location fixed attachment section prepared in the cradle pin 12 on the left-hand side of 10 At the time of the relative rotation between said cradle pin in case a link plate chain bends, and the link plate 2, the location fixed attachment section does not cover the edge of the notch 8 of the link plate 2 any longer. By this There is risk of saying that a gap in the relative side is not prevented to the link plate 2 of each cradle pin. according to [in order to eliminate this problem] this invention — a left-hand side cradle pin pair — the projection or the lobe 22 (refer to drawing 2) is formed in the rolling surface 16 of the cradle pin 12 of 10. This lobe 22 is being engaged in the slot formed in the rolling surface 18 of the cradle pin 14 in which it is faced each other and located, or a notch 24. It turned out that the lobe and the notch are formed so that both the rolling surfaces 16 and 18 can further roll each other. or [furthermore, / permitting it, only by a notch's 24 restricting remarkably a mutual gap of both the cradle pins 12 and 14 to the side of a link plate chain] — or it is formed so that it may prevent (refer to drawing 3). Joining of the lobe 22 may be carried out to the rolling surface 16, and processing shaping may be directly carried out at a cradle pin at one at the time of manufacture. It may be manufactured in [it is the same and / a notch] addenda, and processing shaping may be carried out at the time of manufacture of a cradle pin.

[0012] a lobe and a notch — respectively — the cradle pin of another side — it can form — the cradle pin pair on the right-hand side of drawing 1 — it turned out that 10 is formed in the suitable format.

[0013] metallurgy-[in the manufacturing method of common use of the location fixed attachment section 20, for example, joining, / each cradle pin] weakening — the section is formed. Furthermore, the ingredient selection for the location fixed attachment section is restricted. It is because good weldability with a cradle pin must exist.

[0014] The location immobilization to which such the location fixed attachment section becomes unnecessary is explained per drawing 4 - drawing 8 .

[0015] With this configuration, a gap in the relative side is prevented by the location holddown member 30 of U typeface to the link plate of the cradle pins 12 and 14. This location holddown member 30 has covered the link plate chain by the web 32, and the leg 34 of the location holddown member 30 is equipped with a notch 36, and is formed. the cradle pin pair in which this notch 36 projects from the link plate 2 (refer to drawing 6) besides **, respectively — it penetrates by the edge field of 10, respectively. The notch 38 beveled aslant is formed in the side face of the cradle pins 12 and 14 in which it is mutually located in an opposite side. The lobe 40 currently formed in the edge of a notch 36 engages with this notch 38. It is attained by this configuration of the notch 36 which, on the whole, suited the cross section of a cradle pin that the gap in the side of the cradle pins 12 and 14 of that to which the cradle pins 12 and 14 can penetrate a notch each time is prevented. It is because a lobe 40 contacts the base beveled across the notch 38 when the cradle pin 14 shifts to the side to the location holddown member 30. The location holddown member 30 is held at immobilization so that it may not be lost by the link plate chain.

[0016] when the cradle pin is inserted into the link plate chain, a location holddown member is elastically formed in flexibility especially in the field of a web 32 so that the location holddown member 30 of U typeface can be attached in a link plate chain - having — **** — this — ***** with an elastic location holddown member — it can cover — after that and a spring — the cradle pin in a notch is held by elastic return.

[0017] It turned out that the lobe 40 and the notch 38 may be formed in suitable configuration another each time. In this case, the notch 38 does not need to be beveled aslant. The location holddown member 30 of U typeface is a simple sheet metal part by which the notch 36 is pierced advantageously.

[0018] Another advantage acquired by the location holddown member 30 of U typeface is in the point that this location holddown member can take over the joint guide of a link plate chain. The notch of a location holddown member is because it can form so that a cradle pin pair may be surrounded densely on the whole. In this case, the configuration of a notch can be set up so that a cradle pin may roll each other at the time of the deflection of a chain.

[0019] Another configuration of a location fixed means is shown in drawing 9 - drawing 11 . With this configuration, the edge field which projects from the link plate 2 besides ** of the cradle pins 12 and 14 equips with slots 42 and 44 the field of the side face in which face mutually and it is located which forms rolling surfaces 16 and 18. These slots 42 and 44 have extended covering the total height of a cradle pin. It faces mutually and the spring element 46 which consists of a spring steel wire rod is pushed in in the slot 42 in which it is located, and 44. This spring element 46 has covered the side face of the outside of the link plate 2 in that edge field. The spring element 46 has two arms 48 which face mutually, respectively and are located. Both the arms 48 have combined the circular bracket (Rundbuegel) 50 of each other formed in one, and a preload or preloading is elastically applied to them towards separating mutually. On the whole, slots 42 and 44 are incurvated by the method of outside, and are formed. In this case, since the configuration of an arm 48 conforms to the configuration of a slot, the spring element 46 to which preloading is elastically applied to the pars basilaris ossis occipitalis of a slot is held certainly at Mizouchi. Each spring element is the edge field which an arm 48 closes mutually, and insertion of the spring element to Mizouchi can be easily performed by being pushed in in the path formed of the slots 42 and 44 in which it faces mutually and is located. In this case, first, a spring element is bent in the inner direction, and a spring element is extended and stops to Mizouchi after that.

[0020] The configuration into which the location fixed element, for example, a spring element, was changed is shown in drawing 12 . This spring element is formed as 1 arm-like hook 54. The edge fields 56 and 58 of this hook 54 enclose one cradle pin 12; 14 advantageously, respectively, without being bent in hard flow, and being able to apply preloading, or applying preloading. Since it conforms to the cross section of hook 54 as both the cradle pins 12 and 14 roll [hook 54] and the configuration of slots 42 and 44 is held in each slot 42 and 44 selectively unrelated at least with the location, the cradle pin is certainly held by hook 54. When the cradle pins 12 and 14 rotate mutually, hook 54 is made to deform together depending on the case. The edge fields 56 and 58 where the hook 54 was bent can be additionally engaged in the notch formed in the cradle pins 12 and 14.

[0021] Another configuration of a location fixed means is explained in detail per drawing 13 and drawing 14 . the link plate chain for which the location fixed means shown in drawing 13 is used — a cradle pin pair — the location fixed attachment section 20 which was explained to the cradle pins 12 and 14 of 10 per drawing 1 is formed. It sees in the cross direction of a chain and the location fixed component 60 is being fixed to the outside surface of the link plate 2 besides **, respectively so that the cradle

pin of the inside to an outside cradle pin may roll, respectively and the function of the location fixed attachment section 20 of an inside cradle pin may be maintained also by the time, respectively. the location fixed component 60 which may be a simple sheet metal blanking part — the base part 62 — it is — a notch 8 — both — the space which remains freely between cradle pin pair 10 is covered. The arm 64 is prolonged from the base part 62. This arm 64 is being mechanically fixed to the outside surface of the link plate 2 by adhesion or a certain another approach. The location fixed attachment section 20 of the cradle pin which adjoins this base part 62 overlaps the location fixed component 60 regardless of a rotation location, and in this way, the outside profile of the base part 62 is fabricated as certainly held to the gap. It turned out that one location fixed component is attached in each link plate besides **, respectively. The location fixed component 60 as well as the location holddown member 30 of U typeface of drawing 5 can take over the joint guide of a link plate chain. The location fixed component 60 may be formed in the suitable configuration each time. In this case, the location fixed component has guaranteed the function of the location fixed attachment section 20, and overlaps the link plate.

[0022] The link plate chain with which the link plate which adjoins by the following degree (2 beyond) in the side, respectively corresponds mutually, or link plate arrangement can use this invention for completely different link plate chains, such as the link plate chain repeated after three link plates which adjoin, respectively, or the link plate chain which has the link plate equipped with the notch of two each by which one cradle pin pair is arranged, respectively.

[0023] This invention is not limited to the example of a graphic display. Many change examples become possible within the limit of this invention, not to mention it.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the side elevation of the configuration of the 1st of a link plate chain.

[Drawing 2] It is the enlarged drawing of the part II shown in drawing 1 .

[Drawing 3] It is the detail drawing of drawing 1 which carried out the cross section along the III-III flat surface of drawing 1 .

[Drawing 4] It is the side elevation of the location holddown member of U typeface in which the cradle pin of another configuration of a location fixed means is held.

[Drawing 5] It is the perspective view of the location holddown member of U typeface.

[Drawing 6] It is the schematic diagram of the location fixed means of the cradle pin in the partial cross-sectional view of a link plate chain.

[Drawing 7] They are the location holddown member of U typeface, and the perspective view of a cradle pin which is used conjointly.

[Drawing 8] It is the elements on larger scale of the location holddown member of U typeface shown in drawing 5 .

[Drawing 9] It is the side elevation of the link plate chain equipped with another configuration of a location fixed means.

[Drawing 10] It is the sectional view of drawing 11 which carried out the cross section along the X-X flat surface.

[Drawing 11] It is the top view of the link plate chain shown in drawing 9 .

[Drawing 12] It is the side elevation of the link plate chain equipped with another configuration of a location fixed means.

[Drawing 13] It is the side elevation of the link plate equipped with the configuration into which the location fixed means was changed.

[Drawing 14] It is the sectional view of drawing 13 which carried out the cross section along the XIV-XIV flat surface.

[Description of Notations]

2 Link Plate 4 Link Plate 6 Link Plate, 8 notch 10 Cradle pin pair 12 Cradle pin, 14 Cradle pin 16 Rolling surface 18 Rolling surface, 20 The location fixed attachment section, 22 Lobe 24 Notch, 30 Location holddown member 32 Web 34 Leg, 36 Notch 38 Notch 40 Lobe 42 Slot, 44 Slot 46 Spring element 48 Arm 50 Circular bracket 54 Hook 56 Edge field 58 Edge field 60 Location fixed component 62 Base part 64 Arm

[Translation done.]